RESOURCES BASIC INVENTORY (RBI)

HANDBOOK

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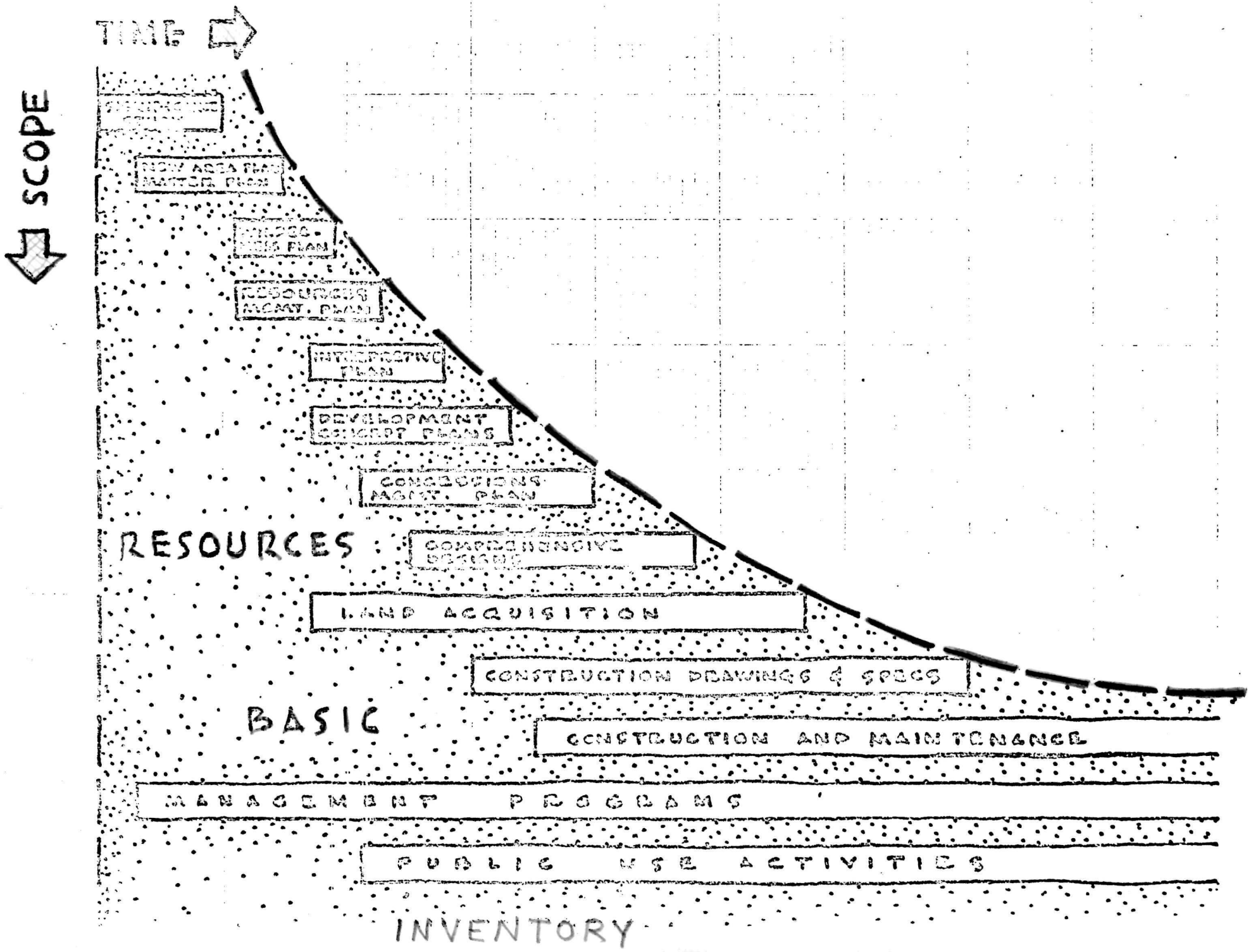
Figure 1. Relation of the RBI to planning and management



CHAPTER I. THE ROLE OF THE RESOURCES BASIC INVENTORY

The basic mission of the National Park Service (NPS) as embodied in the 1916 Organic Act and individual park organic acts is the preservation and use of nationally significant resources. The National Park System affords the visitor opportunities for recreation and learning about park environments. The quality of many of these areas is now threatened by man's activities, both within and outside of park boundaries.

Park managers are faced with the dilemma of providing for recreational and interpretive use of these resources while at the same time leaving them unimpaired for the enjoyment of future generations. An acceptable resolution of this dilemma requires park planning of the highest quality. The NPS must therefore develop and implement a rational system of park use based on fundamental constraints of park resources and facilities.

The Resources Basic Inventory (RBI) provides the data base for intelligent development, use, management, and interpretation of National Park System areas. The RBI is a collection, synthesis, and analysis of information on the biological, physical, social, economic, and cultural environments of a park and its vicinity. NPS Planning and Design Standards require this comprehensive data base before the suitability of park lands for various uses can be determined. Land classification proposals can be considered sound only when based on an adequate RBI. Such an RBI allows for objective

decision-making in accordance with Congressional mandates; in particular, park special legislation, Policy Act of 1969 (NEPA), and the proposed National Land Use Planning and Assistance Act. These acts requires Federal agencies to consider and disclose all environmental factors relevant to proposed actions significantly affecting the quality of the human environment. The RBI provides the foundation on which to carry out this procedure.

The RBI also enables the estimation of provisional carrying capacities for parks and their developments. Such estimations allow park managers to regulate various uses in accordance with the ability of the environment to sustain them without unacceptable degradation.

The RBI provides an objective basis for management related decisions. A good example of this capability is allowing managers and planners to decide whether existing park standards are appropriate. The RBI can help evaluate park standards and provide data for developing revised ones.

RBI is a must for new area studies. When its detail is adequate, managers and planners can readily locate and evaluate various features. This knowledge is needed to make an accurate assessment of the area's national significance. In addition, these same data provide information for drafting establishment legislation.

A comprehensive RBI would facilitate preparation of models that describe the relationships in time and space between various components of the total

park system. This system would encompass all of the park's living and nonliving resources, from wildlife and the park visitor through climate and development. The models allow for prediction of future events or conditions based on known interrelationships. Models make possible prediction of multiple effects based on a knowledge of readily available information. That is, a planner or manager would be able to supply the model with various levels of total visitation and find out how various components of the park system would be likely to respond to each level.

CHAPTER II. DESCRIPTION AND COMPILATION OF THE RBI

The RBI consists of two parts: files and evaluation. The files contain lists, tables, maps, overlays, and accompanying narrative including a bibliography.

The Resources Evaluation is the analysis of the files, i.e., gathered data.

The files contain materials on the following subjects:

A. Physical Characteristics of the Area
    1. Location, Size, Land Use
    2. Topography, Geology, Soils
    3. Hydrology, Aquatic Resources
    4. Climate
B. Biological Characteristics of the Area
    1. Terrestrial Vegetation and Flora
    2. Terrestrial Fauna
    3. Aquatic Biota
C. Environmental Quality
D. Sociological Features
E. Economic Features
F. Antiquities
G. Constraints, Commitments, and Legislative History
H. Park Developments

The specific content of each file (the core of the RBI) is described in the Contents Section of these guidelines (Chapter IV). Map scale, level of detail, and geographic scope will vary from unit to unit of the National Park System, depending on the nature and size of the facility. Decisions defining these parameters can only be made on a project-by-project basis, as indicated below.

The Resources Evaluation is the analysis of the gathered data in a form most usable by planners, managers, and scientists. It contains map overlays that illustrate all of the unique resources and a narrative that describes their significance. The Resources Evaluation serves as the RBI summary pointing out the park's outstanding and less significant resources, and as a graphical and narrative recommendation as to their management, development, interpretation, and use.

To compile a comprehensive information inventory for parks and their resources--a formidable task if attempted all at once--will require a series of successive efforts undertaken in conjunction with various planning and management endeavors. Figure 1 shows how the RBI grows in detail and scope as certain planning and management projects are carried out. Eventually the RBI would become quite comprehensive, yet it would not contain superfluous data, since data would all have been gathered to meet specific needs. One vehicle to bring about and guarantee this result is the planning

directive, a document that will specify precisely what information is needed to solve the particular planning problem that it defines. This procedure is fully in line with that called for in the Planning and Design Process standards (National Park Service 1973), which state that, among other things, the planning directive shall include "an analysis of the planning needs" (p.3). For those decision-making projects not ordinarily preceded by a planning directive (various types of management programs), a problem-defining statement indicating what information is lacking and necessary for the completion of the project will be issued. In this manner the RBI will continue to grow in a meaningful way and with a minimum waste of time and effort, tailored by managers and planners to individual projects and parks, and containing little or no unusable or unuseful material.

In addition to compiling basic resource information, the initial RBI-gathering effort for each park will inventory all relevant sources of data relating to management and use of that facility. By helping to define the magnitude of the data-gathering efforts required for future planning projects, the inventory would act as a guide to the time and expense involved in these pursuits.

Early efforts at RBI compilation may make heavy use of remote-sensed imagery from such sources as ERTS, SKYLAB, and high altitude reconnaissance flights. Data from these sources are routinely sent to the NPS Science Center at NASA's Mississippi Test Facility (MTF), where a large

computer system has been made available to the National Park Service. The ready availability of NASA data at this facility makes it highly convenient for the Park Service to utilize them in RBI compilation. This high altitude imagery generally has an upper scale-limit of 1:62,500, enough to show such regional features as land use patterns, transportation networks, vegetative cover, land forms, drainage systems, and sources and distribution of pollutants. In particular, ERTS images, which are received on a regular basis, are very useful for examining regional changes in the above features over time. The computer system at MTF has extensive capabilities for storing and manipulating RBI data.

A servicewide program for obtaining, manipulating, updating, and dispensing RBI data is now being developed. This program will (1) draw the present fragments of data together; (2) present a management information system that provides these data to park managers through a computer system; and (3) obtain additional data through contracts with universities and other concerns, Service scientists, and professional service centers.

CHAPTER III. RESPONSIBILITY FOR OBTAINING AND UPDATING RBI INFORMATION

The Office of the Chief Scientist (OCS), WASO, is responsible for establishing the policy framework for the conduct of natural and sociological research undertaken throughout the Service. In this role it also provides guidelines and recommendations for the timely acquisition of basic data to serve the needs of management. This Office is also responsible for overseeing the development of an Ecological and Environmental Management Information System that has the capability of collecting, storing, and retrieving ecological and environmental information relevant to the analysis of land and resource use as well as many other characteristics of natural resource and land management. The RBI is the foundation of such an information system.

The Regional Director has ultimate responsibility for the establishment of priorities, scope, completion, and acceptance of RBI materials. The Regional Chief Scientist, in concert with the Regional Archeologist, Historian, and Sociologist, will be delegated the responsibility to determine the appropriate agent who will prepare the RBI. The procurement of RBI materials will normally be a cooperative effort. The data-gathering task may be performed by a multi-disiplinary team which may include personnel from the Regional Office, DSC, park, or by a contract with outside consultants or universities. Responsibility for overseeing the updating of the RBI also lies with the Region.

The Denver Service Center will ensure the timely completion of RBI components that are relevant to planning and development projects for which it is responsible. The determination of the specific RBI project responsibilities of the Denver Service Center will be made by cooperative agreement between the appropriate Regional Chief Scientist and the Supervisory Scientist, DSC. In general, the Denver Service Center will fulfil its RBI project responsibilities by contracting RBI components to outside consultants and will not perform in-house RBI work. Coordination of RBI contracts and provision of quality control will be provided by the Supervisory Scientist, DSC.

The National Park Service Science Center, Bay St. Louis, Mississippi, will be the primary agent for the procurement of RBI for the Service. Through contracts with NASA, the EROS program of the U.S.G.S., and through the coordination of a program of RBI procurement with selected universities will provide the information required by the planners, designers, and managers on a timely basis. The NPSSC under the direction of a Chief Scientist who reports to the Office of the Chief Scientist, WASO will serve as the principal focus for the procurement of imagery, production of maps, and the computerization of the data necessary to produce the RBI sets required by the DSC, the Regions, and the Parks.

From the foregoing it is evident that the Science Center will take the lead in developing a "big picture atlas." Also it will play an integral role in developing and operating the Management Information System.

The University Cooperative Park Studies Units may serve as the primary agent involved in the fact-finding task for the RBI. The Individual park units, as well as the Ecological Service Laboratories also have responsibility in this area which has to be determined on a case-by-case basis.

CHAPTER IV. CONTENTS OF THE RBI

The RBI is more than a simple collection of facts. It is also an evaluation of these facts in a language that managers and planners can understand. It is the identification of constraints and opportunities that vitally influence the planning, management, and use of an area.

In addition to the text, each subject file will consist of graphics, principally map overlays, that summarize, integrate, and evaluate many separate bits of information. A soils map or overlay may identify various soil: it must identify specific use-related properties; e.g., unstabile soils, highly erodible soils, unfertile soils, poorly drained soils. A geologic map or overlay may identify various rock types; it must identify specific unique physiographic features, hazards, mineral deposits, etc. A vegetative map or overlay may identify various plant sociological groups; it must identify sensitivity to disturbance, uniqueness, scientific value and interest to visitors. The point should be clear: the RBI must contain and display information that directly relates to planning and management concerns. Thus, the RBI preparer does more than simply compile data; he must evaluate and present them in a language that is directly usable by managers and planners, who can work with the relevant graphics either singly or in overlaid groups to reach decisions about certain uses or management practices. Obviously, those responsible for identifying data needs must be careful to insure that the many RBI products called for are consistent and compatible in geographic scope, detail, and presentation.

What follows is a subject-by-subject description of potential RBI components. Each subject-section contains a checklist of topics from which subjects can be selected on an individual project basis for inclusion into a particular park's RBI.

The initial compilation of RBI materials for the early stages of the planning process may contain information on only a relatively small percentage of the potential resource features. As later stages of planning are initiated, progressively more of the resource features will be included in the developing RBI. Informational deficiencies for each park will be documented in the Resource Management Plan which defines research projects and establishes priorities. The RBI content therefore is open ended and expanding; the RBI process is a continuing one that has no definable end.

Physical Characteristics of the Area — LOCATION, SIZE, AND LAND USE

Resource Features to be Considered	Source of Data	Use of Data
Land Ownership Federal Non-Federal Government (State, county, local) Private	National Park Service information USGS topographic quadrangles Information from other Federal land-managing agencies State land managing agencies Local and county governments Local regional and State planning commissions Current road maps	Places park in regional context Allows for evaluation of past and present land uses, trends. Defines regional land use patterns Allows for assessment of impacts of land acquisitions Locates areas of existing or potential incompatible uses Defines constraints on park land use and management
Existing Land Use Agricultural Rangeland Commercial Industrial Institutional (including governmental) Designated Natural Reserves Developed Parkland Undeveloped Open Space Residential Other		
Trends		
Land Classification (Park-specific)* 1. High density recreation areas 2. General outdoor recreation areas 3. Natural environment areas 4. Outstanding natural areas 5. Primitive areas and Legislated wilderness 6. Historic and cultural areas		

*Classes 1-6 as adopted in National Park Service administrative policies.

HYDROLOGY AND AQUATIC RESOURCES

Resource Features to be Considered	Source of Data	Use of Data
Inventory Springs Pool size and depth Perennial flow Ephemeral flow Temperature Wells Hydraulic characteristics Specific capacitance Transmissivity Depth, size, and water levels Test pump data Lithologic log Lakes and impoundments Origin Type Oligotrophic Mesotrophic Eutrophic Size Depth Temperature distribution and stratification profiles Nutrient status and availability Currents Rivers Channel morphology Temperature Flood levels and frequency Sediment load, type Streamflow (Maximum, average, minimum; seasonality) Time of Travel Dispersion characteristics of solutes Waste assimilation capacities	Environmental Protection Agency U.S. Geological Survey U.S. Coast and Geodetic Survey U.S. Army, Corps of Engineers National Park Service studies (park files) State health boards State and local planning commissions State natural resources and environmental protection agencies Private consulting firms Private environmental clearinghouses University studies	Assist in planning and managerial decisions in water resources projects involving Domestic water supply Recreational uses of water Fish and wildlife conservation Water quality control Prevention of water pollution Pollution abatement Drainage Flood control Irrigation Navigation Maintenance of natural flows Water conservatio Determine existing chemical, bacterial and physical qualities of water as related to present use of land to note quality changes in the aquatic environment. Determine the effects of urbanization and other land uses on the availability of water (surface and groundwater) in the area

HYDROLOGY AND AQUATIC RESOURCES

Continued: Resource Features to be Considered	Source of Data	Use of Data
Estuaries		
Morphology of estuary		Design of sewage treatment systems in accordance with assimilation capacity of receiving waters
Salinity profile		
Sedimentation: types, distribution, rates.		
Erosion patterns		
Current characteristics		
Physical and chemical composition of materials discharged into estuary		Delineation of areas with high or low potential for water contamination due to past, existing, or proposed uses
Temperature		
Tides		
Range (mean, spring, neap)		
Flood tides (maximum, minimum, average)		
Ebb tides (maximum, minimum, average)		
Tidal prism (mean volume, spring volume, neap volume)		Assist in resolving water rights problems
Horizontal and vertical mixing of estuarine waters		Assist in establishing park's water quality standards
Length of tidal shoreline		
Number and size of entrances to estuary		
Present uses of estuary		
Navigational chart		Determination of the "safe yield" of aquifers for proposed and existing development
Ground Water		
Ground water-surface water relationship		
Aquifer characteristics		
Lithologic characteristics affecting ground water resources		Delineation of potential water sources for development
Ground water composition		
Ground Water Inventory		
Ground water increment		
Rainfall penetration to the water table		
Natural influent seepage from streams, lakes and ponds		Facilitate compliance with Federal and State water quality standards
		Carrying capacity

HYDROLOGY AND AQUATIC RESOURCES

Continued:

Resource Features to be Considered	Source of Data	Use of Data
Ground Water (continued)		
Artificial influent seepage from irrigation reservoirs, spreading and artificial recharge method		
Inflow of free or confined ground water from outside the area		
Ground water decrement		
Effluent seepage and spring flow of free ground water and discharge by surface flow, evaporation and transpiration, or artificial removal by drainage works.		
Effluent seepage and spring discharge of confined water along faults, or slow leakage from the lower portion of aquifers holding confined water		
Artificial pumping discharge		
Subsurface discharge of free or confined water from the aquifer		
Watershed Hydrology		
Delineation of watersheds and drainage patterns		
Water budget		
Precipitation		
Runoff		
Soil storage		
Recharge of ground water reserves		
Evapotranspiration		

HYDROLOGY AND AQUATIC RESOURCES

Continued:

Resource Features to be Considered	Source of Data	Use of Data
Water Use		
Residential, commercial, industrial consumption		
Consumption by park visitors		
Relation between in-park use and availability		
Withdrawals for power generation		
Irrigation		
Interbasin transfers		
State water rights		
Private water rights		
Federal, State, and local laws and regulations governing water use		

Physical Characteristics of the Area — TOPOGRAPHY AND GEOLOGY

Resource Features to be Considered	Source of Data	Use of Data
TOPOGRAPHY Relief Slope Structure, feature locations landmarks, markers, etc.	USGS topographic quardanges USGS geologic maps and survey reports State geologic surveys University research ERTS and other remote imagery	Area description Constraints on development
GEOLOGY Geologic Maps Regional Reconnaissance Quadrangle Special purpose		Identification and location of present geologic features, materials and structures
Geologic Structures (Tectonic features) (Joints, folds, faults, igneous intrusions, saltdomes, dykes, volcanoes, etc.) Identification Location		Identification of geologic hazards
Geologic Materials (Analysis) Igneous Identification Location Classification Metamorphic Identification Location Classification		Interpretation of geologic features, materials and structures Interpretation of area Identification of geologic constraints on development and use Identification of research needs Assessment of the impacts of use on the geologic resource Carrying capacity analyses

Resource Features to be Considered

- Sedimentary
  - Identification
  - Location
  - Classification
  - Sedimentary Structures

- Geologic History
  - Stratigraphy
    - Succession of strata (Paleo-history)
    - Significance of fossils (Paleontology)
    - Stratigraphic time scale
    - Absolute time scale
  - Structural Analysis
    - Mountain building (Orogenic Belts)
    - Rift valleys
    - Continental drift
  - Basin Analysis
  - Paleo-geomorphology
  - Paleo-hydrology

- Recent Geologic Events
  - Catastrophic
    - Volcanic
    - Seismic
  - Gradual
    - Subsidence due to extraction of materials (natural gas, hydrocarbons, water, and minerals)
    - Submergence-emergence
      - Eustatic
      - Change of loading
        - Glacial
        - Tectonic
      - Isostatic

Resource Features to be Considered

Geomorphology (The changing face of the earth)
- Land Forms (types, characteristics)
  - Glacial
  - Eolian
  - Fluvial
  - Volcanic
  - Structural
  - Karst
  - Etc.

- Processes
  - Weathering
  - Erosion
  - Denudation
  - Weathering properties of materials
    - rock weathering
    - soils formation-major soil groups-soil series polygenetic soils, composite soils, fossil soils
  - Slope processes
  - Channel form and process
  - Drainage pattern evolution
  - Evolution of hillslopes

Geologic Hazards
- Earth Movements
  - Slope stability
  - Materials stability
  - Permafrost
- Chemical and weathering instabilities

Mineral Deposits
- Minerals
- Oil and gas
- Sand and gravel

Unique Geologic Values (Of special visitor interest)
(i.e., Old Faithful, Crater Lake)

Physical Characteristics of the Area — CLIMATE

Resource Features to be Considered	Source of Data	Use of Data
General Descriptive Narrative of Climate Maritime influences Continental influences Altitudinal influences Latitudinal influences	U.S. Weather Bureau Records U.S. Geological Survey technical reports U.S. Forest Service University studies Private research stations and other areas where data are collected NPS studies Private consulting firms Private institutions	Background information for planning and management Interpretation Determination of appropriate uses and seasonal distributio of uses Carrying capacity analyses Energy conservation analyses
Climatic Classification Thornthwaite (1931)* system for areas with >15 inches of precipitation per year. Meigs (1953)**system for areas with ≤15 inches of precipitation per year		
Temperature Daily maximum and minimum Monthly maximum, minimum, and mean Annual maximum, minimum, and mean Summer maximum, minimum, and mean Winter maximum, minimum, and mean Recorded temperature extremes Maximum, minimum, and dates of occurrence Number of days per year with temperature ≤ 32°F Average date of first minimum ≤ 32°F Average date of last minimum ≤ 32°F Comfort index/chill factor Isothermal overlays for region and park on an annual and seasonal basis		
Precipitation Rainfall: total by month, mean monthly, mean annual, monthly rainfall intensity.		

Resource Features to be Considered

Snowfall: storm frequency, depth of accumulation, mean monthly, mean annual.
Precipitation summary: total by month, mean monthly, total by year, mean annual.
Isohyetal overlays for region and park on an annual and seasonal basis.

Atmospheric Moisture
- Relative humidity
- Vapor pressure deficit
- Dew point

Wind
- Direction
- Velocity
- Duststorm activity
- Ground blizzard activity
- Canyon venturi effects
- Damage potential due to winds
  - Structural damage
  - Biological damage from windthrow or abrasion by airborne particulates

Evaporation
- Potential evaporation
- Potential evapotranspiration estimates
- Actual evaporation
- Actual evapotranspiration

Solar Radiation
- Mean daily solar radiation
- Total solar radiation
- Net solar radiation

Resource Features to be Considered

Percent cloud cover
Number of clear, partly cloudy, and cloudy days
Prevailing cloud type

National Fire Danger Rating System
Data observation points and methods of obtaining NFDRS data

Fog
Frequency of occurrence
Interception
Type of fog: radiation, advective, upslope, steam fog

Lightning Patterns

Regional and Park Weather Extremes, Describing
Frequency, Intensity, Duration, and Distribution of
Temperatures: maximum, minimum, range
Precipitation: greatest, least, variability, hail and snowfall, drought periods
Thunderstorm activity
Air pressure: maximum, minimum, variability
Wind speed
Dewpoint and humidity
Fog
Thermal inversions
Tornadoes and water spouts
Cyclones and hurricanes
Blizzards
Tidal waves

Resource Features to be Considered

Weather Station Histories
- Station name and location
- Observers
- Dates of observation
- Present and past operating organization or agency
- History of station moves
- Years of record

*Thornthwaite, C.W. 1931. "The Climates of North America According to a New Classification." Geographical Review 21: 633-65 5.

**Meigs, P. 1953. "World Distribution of Arid and Semi-arid Monoclimates." In Reviews of Research on Arid Zone Hydrology, Unesco, Paris. Arid Zone Programme 1: 203-210.

Biological Characteristics of the Area — TERRESTRIAL VEGETATION AND FLORA

Resource Features to be Considered	Source of Data	Use of Data
Vegetational Formations Associations Communities Species composition Stratification Quantitative description: density, cover, and frequency by species and growth form. Life-form analysis Successional status Topographic vegetation profile Condition of Vegetation Vigor Diseases and Infestations Susceptibility to Fire Frequency of fire Intensity of fire Relation of fire to meteorological conditions Utilization Habitat value for wildlife Use by domestic livestock Ecological carrying capactiy (productivity) Flora Floristic inventory: fungi, mosses and liverworts, ferns and fern allies, Gymnosperms, Angiosperms. Habitat affinities of species	U.S. Forest Service; NPS studies; University research; Studies by private institutions and firms; Local and state planning commissions ERTS and other remote imagery U.S. Bureau of Land Management	Wildlife management applications Protection of rare, endangered, or unusual species Control of exotics Fire protection and management Basic data for research in botanical sciences Evaluating potential for plant disease and infestations Landscaping Suitability of lands for development and use Establishment of Research Natural Areas Carrying capacity analyses Interpretation

Biological Characteristics of the Area

Range of species
Endemic species
Threatened species
Ecotypes
Special genetic conditions
Exotic species, including history of establishment and invasion
Ethnobotany
Toxic species
Phenology: dormancy/death, flowering, seed-ripening

Biotic and Abiotic Influences on Community Composition and Stability (including data on productivity)

Resource Features to be Considered

Relation of Species to Man
- Recreational value
- Commercial value
- Effect on man's health (including hazards) and economy
- Existing of historical management program
- Sensitivity and adaptability to man's activities

Biological Characteristics of the Area TERRESTRIAL FAUNA

Resource Features to be Considered	Source of Data	Use of Data
Faunal Inventory Mammals Birds Reptiles Amphibians Invertebrates	NPS studies and surveys U.S. Bureau of Sport Fisheries and wildlife U.S. Forest Service U.S. Bureau of Land Management State Fish and Game records University and institutional research Museum Collections	Identification of ecologically sensitive areas Information for interpretation and education programs Baseline information for scientific studies Basic information for environmental assessments and evaluation of impacts of existing and proposed development, management, and use Establishment of Research Natural Areas Carrying capacity analyses Land suitability analyses
Resident Species		
Migratory Species (including routes of migration)		
Ranges		
Habitat Affinities of Species		
Population Sizes and Dynamics (Trends and Stability)		
Endemic Species		
Threatened Species		
Extirpated Species		
Exotic Species, Including History of Introduction and Spread, and Effects on Natural Ecosystems		
Biotic and Abiotic influences on population components and stability (including data on productivity)		

Biological Characteristics of the Area — AQUATIC BIOTA

Resource Features to be Considered	Source of Data	Use of Data
Floristic Inventory Algae Plankton Zooplankton Vascular Plants	National Park Service studies Bureau of Land Management U.S. Forest Service U.S. Coast and Geodetic Survey Bureau of Sport Fisheries and Wildlife	Identification of ecologically sensitive areas
Primary Productivity	Bureau of Reclamation Atomic Energy Commission	Information for interpretation and eduction programs
Faunal Inventory Mammals Fishes Amphibians Crustacea Molluscs Colenterates Echinoderms Other	Water Resources Council National Oceanic and Atmospheric Administration Environmental Protection Agency River basin commissions State fish and wildlife departments State environmental protection agencies University and institutional research (especially oceanographic institutes) Private consulting firms	Basic information for scientific studies Basic information for environmental assessments and evaluation of impact of existing and proposed management and use
Biotic and Abiotic influences on population components and stability (including data on productivity)		Carrying capacity analyses
Habitat Affinities of Species		
Ranges		
Migratory Species (including routes of migration)		
Exotic Species, Including History of Introduction, Spread and Effects on Natural Ecosystems.		
Threatened Species		
Species Protected by Law		

Resource Features to be Considered

Relation of Species to Man
- Recreational value
- Commercial value
- Effects on man's health (including hazards) and economy
- Existing and historical management programs
- Sensitivity and adaptability to man's activities

Description of Plant and Animal Communities
- Lakes and Impoundments
  - Trophogenic zone
    - Littoral subzone
    - Limnetic subzone
  - Tropholytic zone
  - Benthic communities
- Rivers and Streams
- Springs
- Estuaries
  - Non-benthic communities
  - Benthic communities
- Seas
  - Supralittorial zone
  - Littoral zone
  - Sublittoral zone
  - Pelagic zone

Community Composition and Stability, as well as on the Productivity of Aquatic biota

Research Features to be Considered	Source of Data	Use of Data
Identification, description, and source of pollutants in each of the following classes: Nutrients Toxic metals Toxic organics Pathogens Radioactive contaminants Gases Aerosols Airborne particulates Heat Noise Architecturally or esthetically incompatible or hazardous developments, objects, or activities	Atomic Energy Commission Environmental Protection Agency NPS studies U.S. Geological Survey U.S. Forest Service State water boards State environmental protection agencies State health boards Research studies by universities, institutions, and governmental agenci Private consulting firms Private clearinghouses	Establishing benchmarks for relatively upolluted conditinns Proposing abatement programs for directly controllable pollutants Seeking abatement of pollutants that are not directly controllable
Concentration and distribution of the plllutants; frequency of occurrence of discrete events generating the pollutant		
Temporal and spatial trends in the parameters cited above (e.g., plans for abatement, proposed and imminent activities leading to increases, regulations governing pollutant-generation, pressures for abatement or increase)		
Type of pollution, chronic or acute		
Effects of the pollutant both direct and indirect		
History of the pollutant in the area		

Data Needed	Source of Data	Use of Data
Regional Information Demographic profile: population data (rural farm and non-farm, urban and suburban metropolitan population), population density, ethnic and racial composition, length of residence, percent residing in state of birth, median school years completed, household composition, and family structure. General socioeconomic characteristics: median family income, proportion working outside county of residence, employment by occupational status, industry of employed persons, labor mobility. Interest groups: private and public groups with interest in the park and its resources (conservation groups, chambers of commerce, county and state planning commissions, motel-hotel and campground associations, etc.), nature of interest and influence.	U.S. Census Bureau; Census of Agriculture (USDA); state, county, and local planning commissions; NPS visitor surveys and visitation statistics. Surveys by USFS, BLM, and other Federal land managing agencies.	Carrying capacity analyses Determination of appropriate development. Management to optimize visitor experience and minimize social conflict Orientation of interpretation to public served. Determination of recreational and social value of park to region and nation. Matching visitor expectations with constraints of the resource.
Visitor Analysis (Region and Park) Origin and destination of visitors Length of stay in park and region Overnight and day use; kind of overnight accomodations. Kinds, schedule, and location of activities pursued in region and park. Frequency of return to park and region; reasons for return visits. Socioeconomic description of visitors (income, occupation, education). Group composition of visitors (number in group; sex; age; group type such as family, friends, organized club). Motivation for visit(s); satisfaction with visit(s) and individual activities (e.g., the degree to which expectations were filfilled). Description of sociological problems in region		

incompatible behavior and activities).
Attitudes of visitors toward various land uses in region and park.
Methods of estimating visitation to region and park.

ECONOMIC FEATURES

Data Needed	Source of Data	Use of Data
Regional Information		
Recreational facilities, visitation, and revenues	NPS visitor surveys and records County and local government records U.S. Bureau of the Census data U.S. Forest Service U.S. Geological Survey Applicable legislation State Employment Security Administrations State and local planning commissions Local boards of realtors	Assessment of economic impacts for land acquisitions development changes in recreational activities park payrolls expenditures, and operations existing and projected levels of park visitation prohibition of land uses, as in designation of wilderness areas and establishment of new park are
Private facilities		
Local public facilities		
State facilities		
Federal facilities		
Lodging facilities and occupancy		
Economic input-output table		
Employment		
Job categories		
Pay scales		
Location of employment		
Number and skills of unemployed		
Housing		Carrying capacity analyses
Availability		
Type and occupancy		
County tax revenues		Development of planning and management alternatives
Sources		
Amounts		
Uses of		
Park Information		
Recreational facilities, visitation, and revenues		
Lodging facilities and occupancy		
Concession services		
Type		
Revenues		
Profits		
Park operating budget		
Appropriated funds		
Land acquisition		
Capital improvements		
Other		
Inholdings		
Assessed valuation		
Tax revenues		
Use		
Services provided by NPS and local governmental [illegible] and the costs thereof		

ECONOMIC FEATURES.....continued

Timber resources
  Type
  Market value
  Sustained yield value
Mineral resources
  Type
  Market value
Economic effect of the park on
  surrounding property.

(NOTE: much of the information required for economic analyses must be obtained from relevant portions of the Lands and Sociological Features sections of these guidelines)

ANTIQUITIES

Research Features to be Considered	Source of Data	Use of Data
Description and location of prehistoric sites and artifacts (habitation, quarrying and mining, knapping sites, fields, burials, cemeteries and mounds, rock art and effigies, trails,and roads, reservoirs, wells, and irrigation systems, animal traps, killing and butchering sites, shrines and caches, midden deposits); relation of sites to one another; influence of environment on location of sites; statement of the significance and potential of archeological resources for contributing information about archeological problems; description of prehistoric cultures represented by the sites and artifacts.	Archeological surveys; Historic Structures Reports; State and local historical societies; museums; private collections of artifacts.	Protection, stabilization, and interpretation of historic and archeological resources. Providing bases for further research on historic and archeological problems.
Description and location of historic events, structures, ruins, sites, roads, and trails.		
List of sites on the National Register of Historic Places, National Register of Historic Landmarks, and List of Classified Structures; sites not on the above lists but probably worthy of inclusion.		
Description of past and present uses of historic structures and sites.		
For archeological surveys: description of methods, intensity, and geographic extent of survey; indication of stabilization needs and recommendations for preservation.		
Summary of archeological and historical research in the park or region.		

CONSTRAINTS, COMMITMENTS, AND LEGISLATIVE HISTORY

Research Features to be Considered	Source of Data	Use of Data
Copy of enabling and supplemental legislation.	Congressional Record; Code of Federal Regulations, Park files	Aid in defining the purpose and objectives for the management and use of a park.
Transcript of Congressional hearings, letters, and other documents relating to establishment.	Library of Congress	
Excerpts form the Code of Federal Regulations relating to restrictions on land uses within a park (e.g. mining, grazing, etc.)		Identification of constraints on the management and use of a park.
Memoranda of agreement, concession contracts, letters, and other documents relating to management and use of a park.		
Special use permits, scenic easements, deed restrictions, and other land use commitments.		

PARK DEVELOPMENTS

Research Features to be considered	Source of Data	Use of Data
For all developments within the park (administrative, management, and maintenance facilities; roads, trails, boardwalks, parking areas, visitor centers and visitor contact stations; sanitary facilities; utility systems; backcountry facilities; marinas and docks; research facilities): Purpose Location Size Capacity Date and cost of construction and modifications Description of maintenance and use problems Cost of operations (energy demand)	Park files, Service Center records, Regional Office files	Evaluation of the adequacy of the various developments for present or proposed uses (includes carrying capacity analyses).

RBI Committee

William Gregg - Chief Scientist - DSC
Neal Guse - Research Biologist - WASO
Garrett Smathers - Chief Scientist - PNR
Roland Wauer - Chief Scientist - SWR

Committee Participants

John Austin - Economist - DSC
Gene Balaz - Environmental Coordinator
Paul Buckley - Research Zoologist- WASO
Phillip Dittberner - Soil Scientist - DSC
Harvey Fleet - Ecologist - DSC
Eric Janes - Forest Hydrologist - DSC
Larry May - Ecologist - DSC
Gary Moore - Hydrologist - SWR
Ralph Root - Geologist - DSC
Linda VanKeuren - Sociologist - DSC
Gerald Wright - Systems Ecologist - DSC